

BEST AVAILABLE COPYPatent Application
NC 82,637

Remarks/Arguments

Presently pending claims are claims 19-22, 24 and 25.

Claims 19-22, 24 and 25 have been rejected as being indefinite for presence of the term "several" in the claims. The Examiner is of the opinion that reciting that the splat microstructures greater than several microns thick is indefinite since the term "several" does not indicate what particular thicknesses are permissible.

The dictionary definition of the term "several" is more than two and fewer than many. As used in the claims herein, the term "several" denotes a typical thickness of the splat microstructures which was to be excluded due to their deleterious affect on the thin film coating in that, inter alia, the splat boundaries in the coatings are often the initiation sites for flow propagation that lead to coating failures. It should be apparent that the term "several" is not indefinite in denoting thickness of the splats but conveys a general consequence of using splats greater than several microns in thickness which result in flaw propagation. In this context, the term "several" certainly does not mean 1000 microns nor 100 microns. The general use of the term "several" today means a number below 10.

Claims 19 and 20 have been rejected under 35 USC 102(e) as anticipated by the Hunt reference. It is believed that claims 19 and 20 are no longer properly rejectable on the Hunt reference since claims 19 and 20 specify that the thin film or coated

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material is made by thermal spraying solution precursors and are devoid of splat microstructures greater than several microns thick whereas the Hunt reference discloses powder formation and thin film deposition by vapor deposition. Furthermore, the Examiner has admitted that the Hunt reference is silent as to the size of the splats or anything connected therewith.

Claims 21, 22, 24 and 25 were rejected under 35 USC 103(a) as being obvious over the Hunt reference. Since the Hunt reference does not exemplify an embodiment that is both multilayered and graded, the Examiner has concluded that it would have been obvious to form a multilayer nanostructure which was graded since it is specifically suggested as a suitable structure by the reference.

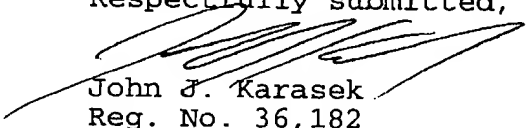
The rejection of claims 21, 22, 24 and 25 as being obvious over the Hunt reference is hereby traversed. The Examiner should note that claims 19 and 20 define the multilayer thin film or coating to a material that is made by thermal spraying of solution precursors and a material that is devoid of splat microstructures greater than several microns thick. As noted at bottom of p. 2 and top of p. 3 of the specification, although thermal spraying is a viable approach to preparing thick coatings, the use of the powder agglomerate feedstock has limitations and problems. First, the sprayable powders often require reprocessing from the parent powders by controlled agglomeration, which adds more cost to the production and often introduces impurities if surface-active

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precursors are used as binders. Second, the splat boundaries in the as-sprayed coatings are often the initiation sites for flaw propagation that consequently lead to mechanical failure of the coatings. Third, the as-formed splat microstructures present a limitation on the scale of chemical homogeneity and mixing of multiphase materials when desired because the splat is at least greater than several microns thick, due to the flattening of the molten particles on impact. Unfortunately, these large splat particles become a serious problem when multifunctional applications require multilayered, hybrid coatings with fine, continuous interfaces, since the length scale of an interface is limited by the splat microstructure. Consonant with what is stated above, the Hunt reference discloses powder formation and thin film deposition by vapor deposition and is, therefore, not consonant with an obviousness rejection.

It is believed that the claimed subject matter herein is unobvious over the Hunt reference and a notice of allowance of claims 19, 20, 21, 22, 24 and 25 is requested. A Notice of Appeal of claims 19, 20, 21, 22, 24 and 25 is hereby enclosed.

Respectfully submitted,


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the date shown below:

Nov. 6, 2003
Date

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